



BARCELONA

PILOT 3. Monitoring Pollutants in Urban Allotments



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PILOT 3. Monitoring Pollutants in Urban Allotments

Start date: April 2020

End date: August 2024

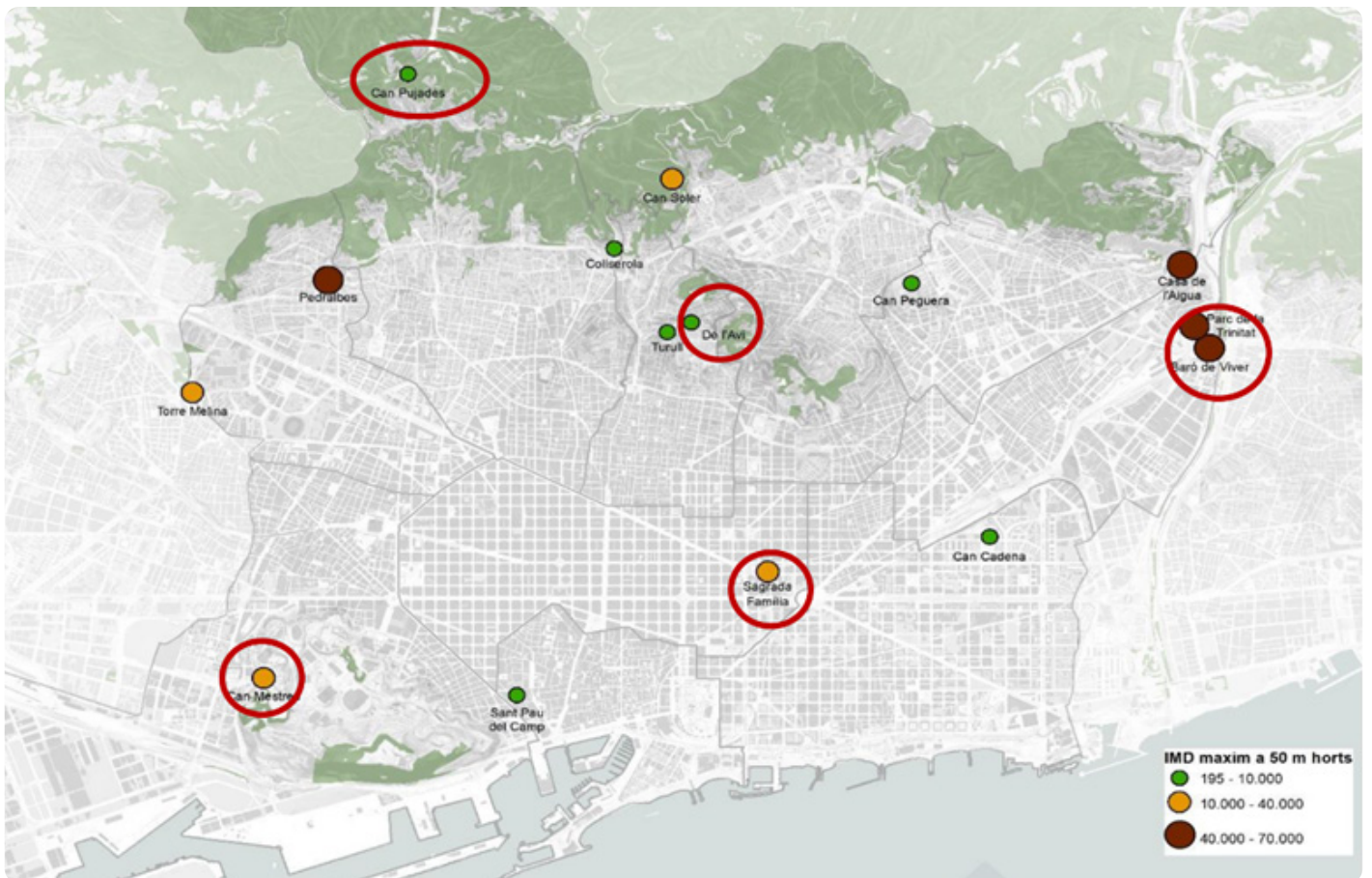
What and Where?

Evaluate, process and analyse data on heavy metal contamination (Zn, Mn, Cr, Cu, Pb, Ni, V, Cd, Co) in chard leaves and in soil from municipal urban allotments (6 gardens).

Location:	<ul style="list-style-type: none">• Urban allotment "Baró de Viver" (Carretera Santa Coloma, 125),• Trinitat (Carretera de Santa Coloma, 60),• Casa de l'Aigua (C/Garbí, 2),• Can Soler (carretera de Vallvidrera, 114),• Can Pujades (Múrgola, 13),• Sagrada Família (Padilla, 199).
NBS type, and habitat/s:	Urban allotment.
Ecosystem services:	Purification of air, climate regulation, food provision, social cohesion, environmental education, recreation experiences.
Management & maintenance:	The management and maintenance of these spaces is carried out by Barcelona City Council.



Map



Why?

Contamination studies can provide information on health effects of some sampled vegetables.

Know how atmospheric pollution can transfer to the edible parts of plants produced in urban allotments, and know how edible plants are affected by soil contamination.

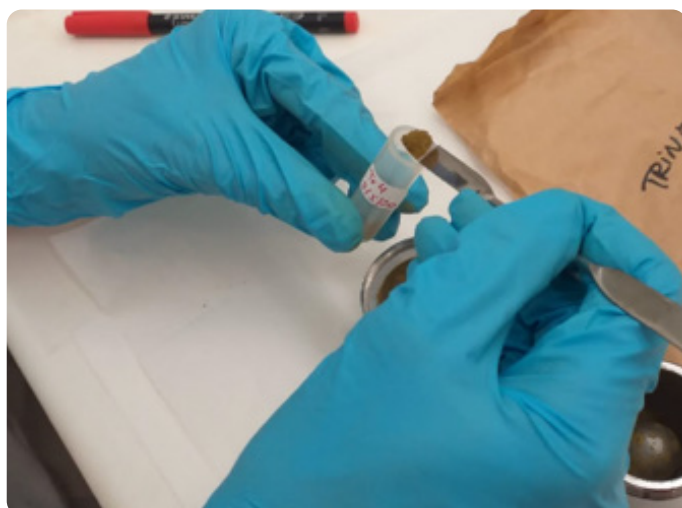
When?	2021	2022	2023	2024
Urban allotment sites evaluation, prioritisation and selection considering the surroundings of each site in terms of air pollution emission sources, air pollutants dispersion model and emission values				
Definition of the approach of monitoring				
Monitoring air pollution deposition				
Processing data				
Results				



How?

The soil samples were collected with a cylindrical probe that was vertically inserted into the soil up to 10 cm deep, in an area close to the roots (rhizosphere) of the Swiss chard. The same number of soil samples were taken (5 samples for each orchard, a total of 30 samples), to ensure a sufficient number of replicates.

The leaf samples were dried in an oven at 65°C for 3 consecutive days, and the soil samples were dried at 105°C for 2 consecutive days. All these samples were crushed in the CREAM laboratory and analysed in the SAQ (Chemical Analysis Service) of the UAB. Prior to ICP-MS analysis (Agilent, 7500ce), samples were digested with a microwave digester and sample acidified (HNO₃ 69%).



So what?

The soils of the orchards are not polluted and are within parameters accepted by various legislations and (ii) the intake of chard leaves from the orchards studied does not pose any risk to human health (from the point of view of heavy metals).

The study clearly shows that the intensity of vehicle traffic is related to the concentration of certain pollutants in all the orchards studied.

The main source of the metals Mn, Cu, Zn and Pb in the leaves is air/transit (uptake leaf epidermis and translocation). These results indicate that chard leaves, which are grown in almost all urban gardens in Barcelona, can be used in the biomonitoring of air quality (heavy metals).

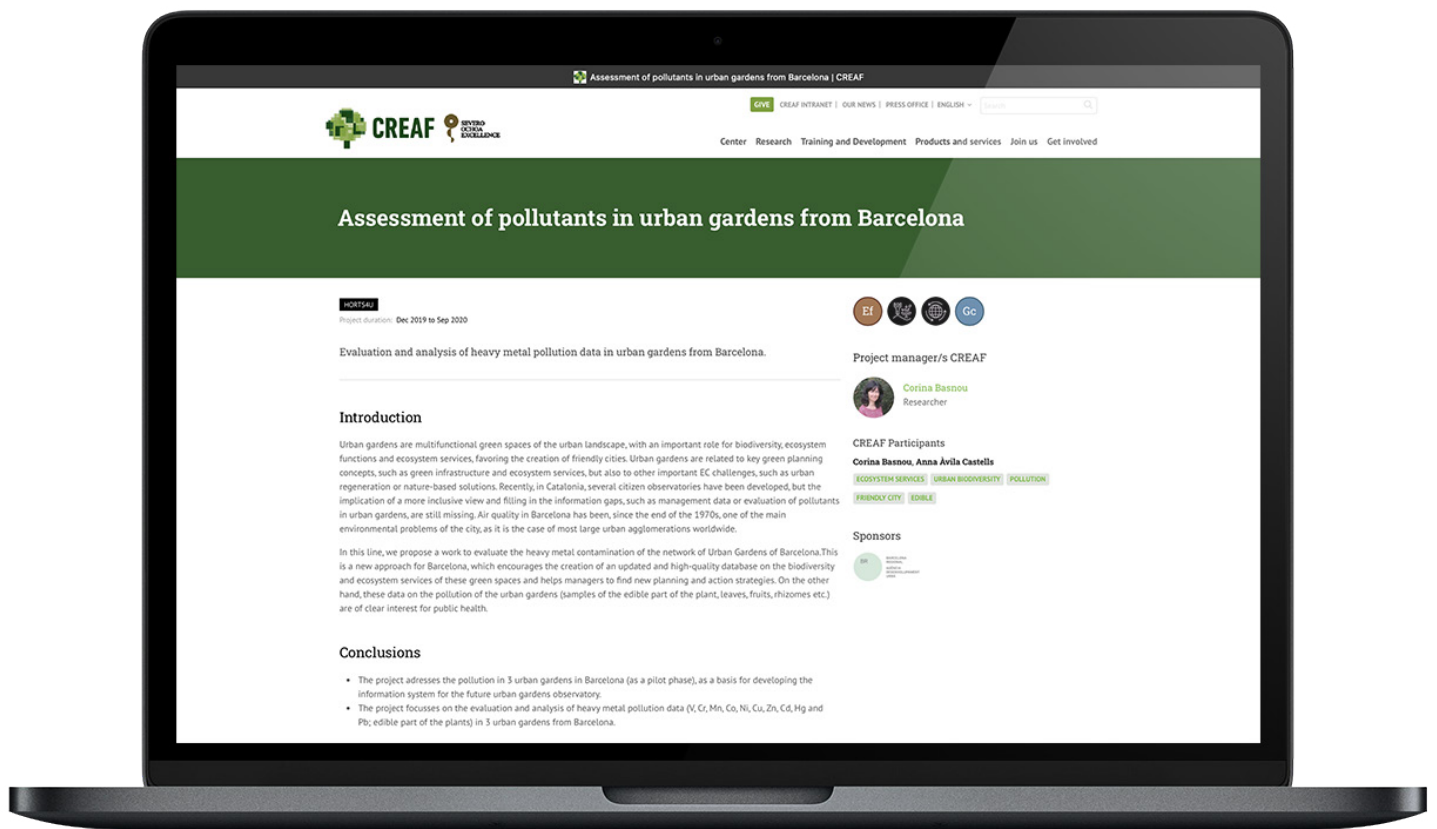
Combining the methodology of this study with soil analysis has led to important advances in understanding bioaccumulation in plants grown in Barcelona's orchards. The results show that the soil-plant system is an important sink of particles.





Executive Summary

Publication and dissemination of results



Project Partners



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